

REMARKS

This is intended as a full and complete response to the Final Office Action dated April 26, 2011, having a shortened statutory period for response set to expire July 26, 2011, and the Advisory Action dated August 1, 2011. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-20 and 22-43 remain pending in the application and are shown above. Claims 21 and 44 have been cancelled by Applicant without prejudice. Claims 1-20 and 22-44 stand rejected by the Examiner. Reconsideration of the rejected claims is requested for reasons presented below.

In a Response to Final Office Action, filed June 27, 2011, Applicant proposed amending Claim 1 to clarify the claimed subject matter, from language previously presented as Claim 44. The Examiner issued an Advisory Action on July 18, 2011, but did not enter the proposed amendment at that time. This Request for Continued Examination and accompanying amendments to Claims 1 and 22 are filed in response.

Claim Rejections – 35 U.S.C. § 103

Claims 1-20 and 22-44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Hosoki et al.* (US 3,714,422) in view of *Abe et al.* (US 6,534,766). Applicant respectfully traverses this rejection.

Hosoki describes a charged particle beam apparatus provided with an adjusting device to change an impinging angle of charged particle beams to be irradiated onto a specimen, thereby enabling a stereo-image thereof without tilting the specimen. In Fig. 6 of *Hosoki*, numeral 12 designates an electrode for dividing the electron beam into two beam portions, and numerals 13 and 14 designate deflecting devices. A negative voltage is applied to the dividing electrode 12 by means of a very thin metal wire, etc. The electron beam focused on an image plane of the focusing lens 3 is divided by the dividing electrode 12 into two beam portions. The two electron beam portions pass respectively through the deflective devices 13 and 14 and then enter into two passage holes of the aperture plate. Accordingly, by deflecting one of the divided electron beams, one of the beams does not reach its corresponding passage-hole on the aperture plate. It is thereby

possible to vary the impinging angle of the electron beam radiated onto the specimen, as shown by solid line or dotted line.

According to the Examiner, the embodiment of *Hosoki* depicted in Fig. 5 discloses two electrodes (10, 11), wherein one of the electrodes (10) has two openings (allegedly similar to present claim 1). However, in order to alternately open and close the two apertures of the aperture plate 10, a shutter 11 having a single aperture is provided contacting the aperture plate 10. By shifting the shutter 11 in the transverse direction, a focused electron beam of different impinging angles may be irradiated alternately on the specimen, and the same region covering SS1 can be scanned. While the apertures of the plate 10 require high precision, the aperture of the shutter 11 needs not be so high in its precision as that of the plate 10, such that a stereo-image of the specimen can be observed.

The Examiner admits that *Hosoki* does not disclose a driving means coupled to at least one out of the first electrode and the second electrode (10, 11) for aligning the first opening with the second opening. (Office Action, page 4). In order to solve this missing feature, the Examiner cites *Abe*. *Abe* discloses a SEM having a plurality of electrostatic and magnetic lenses. Fig. 7 shows a charged particle beam system 30 comprising an electron gun part, an electron-optical system, a stage, a secondary electron image acquiring part, and a control part. The acceleration electrode 16 accelerates the extracted emission electrodes to cause the electrons to be incident on the electron-optical system as electron beams 6 / 8. Fig. 7 further shows a correction deflection calculating part 66 and an objective lens correction control part 68. In this embodiment, the trajectories 8 of the electron beams 6 are shifted by the scanning deflecting device 26, and the center of the objective lens 28 is shifted to the position after the trajectories 8 of the electron beams 6 are shifted, so that a deterioration of an electron-optics property can be prevented.

Nevertheless, a combination of the two documents does not disclose the features of the claims, because the stereoscopic feature of *Hosoki* means that the images obtained by having the beam pass through either of the two openings are different. Furthermore, according to *Hosoki*, the multiple opening in electrode 10 (see Fig. 5) are not actually

physically replaced by each other, but only mutually covered by the shutter 11 with one opening 10. Additionally, *Hosoki* does not disclose that the shutter 11 is a first electrode.

This is also important with respect to the obtainable effect of the replacement of the openings. While in *Hosoki*, the replacement requires modifying the beam path in order to direct the beam to the left or right opening. This is not necessary in the present claims. As clarified in amended Claim 1, the active opening “is in line with the charged particle beam.” This feature is not shown or disclosed by *Hosoki* or *Abe*, whether alone or in combination. In contrast, the two openings of *Hosoki* are not in line with the electron beam. As can be seen in Fig. 5 of *Hosoki*, the beam is strongly deflected, such that the opening cannot be in line with the electron beam, because “in line” with an electron beam means that the opening is positioned in the path of the undeflected, straight electron beam. Withdrawal of the rejection is respectfully requested.

In the Advisory Action of August 1, 2011, the Examiner “respectfully disagrees that *Hosoki* fails to disclose that the multiple openings replace one another as evidenced from Fig. 5.” However, the Examiner does not address the points above. Specifically, *Hosoki* fails to disclose first and second electrodes, and *Hosoki* fails to disclose that “the multiple openings replace one another as an active opening that is in line with the charged particle beam,” as required in Claim 1. As such, withdrawal of the rejection is respectfully requested.

Further, Claim 1 is amended herein to provide, “wherein the first and the second electrodes are separated by a distance.” Figure 5 of *Hosoki*, which is cited by the Examiner, does not disclose this feature. Shutter 11 and aperture plate 10 are not separated in *Hosoki*, as shown in Figure 5. Withdrawal of the rejection is respectfully requested.

Moreover, the combination of *Abe* and *Hosoki* do not disclose that after a replacement of one of the multiple openings of an electrode with another, the new opening would be at the same location as the previous opening, which would be necessary to still have the new opening in line with the particle beam. Instead, when combining the two documents, the active opening resulting from a replacement would be displaced horizontally and would thus not be in line with the particle beam. It is noted that in the

Advisory Action, the Examiner states that the amended features are “no more than predictable use of prior art elements according to their established functions.” (Continuation Sheet.) Applicant respectfully submits the Examiner’s assertion is clearly incorrect, as it would require grave modifications to an apparatus resulting from a mere combination of the teachings of *Abe* and *Hosoki* in order to arrive at the apparatus of amended Claim 1.

If the elements of *Hosoki* were modified in order to function such as presently claimed in Claim 1, they would no longer function according “to their established functions.” The aperture plate 10 (the electrode) in Figure 5 of *Hosoki* is not movable, but shutter 11 is movable in order to allow passage either through the left or right opening of the aperture plate 10, for the purpose of stereo imaging. In order to arrive at present Claim 1, aperture plate 10 would thus have to be “mobilized” in order to be able to exchange the two openings with each other in the path of a particle beam, wherein the openings would be interchanbeably below the opening of the shutter 11. Shutter 11 would have to be turned into an electrode and would then have to be separated a distance from the aperture plate 10. However, in this case, stereo imaging (as was the purpose of *Hosoki*) would no longer be possible, which would give the apparatus and elements of *Hosoki* completely new functions – much in contrast to the alleged “predictable use of prior art elements according to their established functions” cited by the Examiner. Moreover, there is clearly no motivation for a skilled person to carry out such modifications, let alone to combine the documents in the first place. Withdrawal of the rejection is respectfully requested.

Independent Claim 22 is also amended herein to provide, “wherein the first and the second electrodes are separated by a distance.” As discussed above for Claim 1, Figure 5 of *Hosoki*, which is cited by the Examiner, does not disclose this feature. Shutter 11 and aperture plate 10 are not separated in *Hosoki*, as shown in Figure 5. Withdrawal of the rejection is respectfully requested.

In addition, independent Claim 22 provides the features of a first electrode, a second electrode, a first driving means, and:

whereby at least one out of the first and second electrodes is shaped to comprise multiple openings for focusing the charged particle beam,

whereby at least one out of the first and second electrodes is shaped and positioned to provide that the distance of at least one of the multiple openings to an opening of an adjacent electrode in axial direction is larger by at least ten percent compared to the distance in axial direction of at least one of the other of the multiple openings to said opening.

There is no disclosure in either *Hosoki* or *Abe* of the arrangement provided above. The Examiner contends that *Hosoki* shows that “[t]he distance between the opening in the first or second electrode is at least ten percent larger than the distance between the two electrodes [Fig 5].” (Office Action, page 4). Applicant respectfully submit that the Examiner’s rejection does not address the features provided above. The claim language does not compare the distance between openings in one electrode to the distance between the electrodes. Rather, Claim 22 provides for different distances in the axial direction. More specifically, Claim 22 provides that “the distance of at least one of the multiple openings to an opening of an adjacent electrode in axial direction is larger by at least ten percent compared to the distance in axial direction of at least one of the other of the multiple openings,” as recited more fully in the claim. As shown in Fig. 5 of *Hosoki*, the two apertures of the aperture plate 10 have the same distance in the axial direction to the opening in the shutter 11. Thus, there is simply no feature in *Hosoki* that discloses or suggests the arrangement provided in Claim 22. *Abe* is also silent regarding the above quoted arrangement. Therefore, the features of Claim 22 are not shown or disclosed by *Hosoki* or *Abe*, whether alone or in combination. Withdrawal of the rejection is respectfully requested.

Further, independent method Claim 39 requires “providing a beam optical component according to claim 1,” as recited more fully in the claim. Because the features of claim 1 are not disclosed or suggested by the cited references, the method steps using “a beam optical component according to claim 1” are also not disclosed or suggested. Withdrawal of the rejection is respectfully requested.


Because the independent claims are allowable, the dependent claims are also allowable for the reasons provided above. Therefore, claims 1-20 and 22-43 as amended are patentable over *Hosoki* and *Abe*, whether alone or in combination. Withdrawal of this rejection is respectfully requested.

Conclusion

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,

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